

Administrators/Instructors Manual

Youth Apprenticeship Health Training Program

Contents

- Occupational Health Safety
- Industrial Hygiene
- Environmental Factors
- First Aid
- CPR

This material is available to you in different forms — large print, Braille or audiotape — if you call (651) 284-5090 (general information) or TTY (651) 297-4198 and request the service.

Manual Overview

The health of our youth is important to us! We don't want them to get sick or injured at work. That's why we have created this basic health safety information. We want them to understand how to stay healthy. This helps prevent them from getting ill or hurt when they do their job.

There are five Lessons in this Workbook. You can ask them to do the assignments on their own, or you, as the instructor, can guide them through the lessons. **Either way, they win.** Its better that they know the kinds of health issues and the proper way to keep healthy before they do something that might get them sick.

Prevention starts with understanding occupational health safety, personal and industrial hygiene, and knowing their work environment. That's what **Lessons 1 through 3** talk about.

We understand that the use of personal protective equipment (PPE), machine guarding, walking and work surfaces, materials handling and hazards communications help protect youth from injuries. But, if they get hurt, they need to **know what to do**. That's why **Lessons 4 and 5** talk about basic first aid and CPR.

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Instructions

As they step through each of the lessons, the student will be asked some beginning questions, called a Pre-Quiz. They are included to help them understand the kind of information that is included in the lesson, and to find out how much they already know about the topic.

At the end of each lesson there is a lesson test. They must complete the test and turn it in to you or their supervisor. You will grade their test and share the score with them.

1. Occupational Health Safety

Introduction

More than 90 million Americans spend their days on the job. They are our most valuable national resource.

Two real events from the Minnesota OSHA archives are presented to illustrate health hazards and their result. The first describes Hydrogen Sulfide Poisoning from a 12 foot deep manure pit. The second event describes Excessive Exposure to Freon 113 from a confined space.

This lessons' introduction also discusses how the Occupational Safety and Health Act of 1970 was created. In summary, in 1970, Congress evaluated annual safety figures and found that:

- Job related accidents accounted for more than 14,000 worker deaths.
- Nearly 2 ½ million workers were disabled
- Ten times as many person-days were lost from job-related disabilities as from strikes
- Estimated new cases of occupational diseases totaled 300,000.

Because of lost production and wages, medical expenses and disability compensation, the Occupational Safety and Health Act of 1970 was passed by Congress "... to assure so far as possible every working man and woman in the Nation safe and healthful working conditions and to preserve our human resources."

Outcomes

Outcomes

After the students complete Lesson 1, they can name potential health hazards. They can bring these problems to their supervisor. They can correct many of the problems themselves to prevent injuries and illness. They learn what to look for, how to prevent health problems, when to seek medical treatment and record keeping as they do their job.

Pre-Quiz Answers

1. The Occupational Safety And Health Administration Act Of 1970 was created to assure that every employee has...
 - A) A job.
 - B) A safe and healthy workplace.**
 - C) Workers Compensation Benefits.
 - D) Fair Wages .

2. Which health hazard is NOT a priority according to OSHA?
 - A) Imminent danger.
 - B) Serious physical harm.
 - C) Temporary disability.
 - D) Basic first aid.**

3. Which kind of agent is NOT harmful to your health:
 - A) Physical Agents.
 - B) Infectious Agents.
 - C) Federal Agents.**
 - D) Air Contaminants.

Lesson Summary

In **Lesson 1** the students are introduced to the basics of **occupational health safety**. This included:

- Occupational Health
- Employee Right-to-Know
- Harmful Agents
- Air Contaminants and Permissible Exposure Limits
- Environmental Controls and Record Keeping
- Medical Treatment, Pre-existing Conditions and Locations Covered

This includes standards that apply limitations for noise, radiation and air contaminant exposures, requirements for ventilation, toxic health hazards, environmental controls, record keeping, medical treatment and the locations covered.

Occupational Health and Safety means protecting health and life. Three additional examples from the Minnesota OSHA archives were presented to show how important it is to be aware of safety and health.

The first example illustrates a rooftop Fall From Elevation. FALLS ARE THE NUMBER ONE CAUSE OF SERIOUS INJURY AND DEATH IN THE WORKPLACE.

The second example illustrates Electrocution. MOST ELECTRICAL CONTACTS, REGARDLESS OF VOLTAGE, RESULT IN EITHER DEATH OR VERY SERIOUS INJURY.

The second example illustrates a Trench Collapse. UNSAFE TRENCHES KILL AT LEAST ONE WORKER EVERY YEAR IN MINNESOTA.

This lesson also briefly covers the Employee Right-to-Know Act, intended to ensure that employees are aware of the dangers associated with hazardous substances, harmful physical agents, or infectious agents they may be exposed to in their workplaces.

Reference Highlights

In Title 29, Chapter XVII of the Federal Register Code of Federal Regulations, the regulations are broken down into Parts. Part 1910 is the “Occupational Safety and Health” Standards.

- Subpart G – Occupational Health and Environmental Control
- Subpart J – General Environmental Controls
- Subpart K – Medical and First Aid
- Subpart Z – Toxic and Hazardous Substances

Subpart G and Z go together since they are health related. Subpart G contains ventilation requirements and limitations for noise and radiation exposures. Subpart Z contains limitations for air contaminants as well as specific standards for certain toxic health hazards, e.g. asbestos, lead, inorganic arsenic, and acrylonitrile.

Subpart J, General Environmental Controls, contains requirements for sanitation, temporary labor caps and “non-water carriage disposal systems.”

Subpart K contains requirements for first aid and consists of only three paragraphs. The first paragraph requires the ready availability of medical consultation on worker health. The second paragraph requires first-aid trained personnel when the company is not geographically close to a hospital. The third paragraph requires eye washes and deluge showers to be in the work area where employees might be exposed to injurious corrosive materials.

Additional Reference Sources

National Institute for Occupational Safety and Health (NIOSH)

U.S. Department of Health and Human Services
Publications Dissemination
4676 Columbia Parkway
Cincinnati, Ohio 45226
(513) 533-8287

Part of the Centers for Disease Control and Prevention. Supports and conducts research on occupational safety and health issues. Provides technical assistance and training. Develops recommendations for OSHA. Operates an occupational safety and health informational bibliographic database.

National Institute of Health (NIH)

U.S. Department of Health and Human Services
9000 Rockville Pike
Bethesda, Maryland 20205
(301) 496-5787

Supports and conducts biomedical research into the causes and prevention of diseases and furnishes information to health professionals and the public.

Topics For Classroom Discussion

Carbon dioxide extinguishing systems not being inspected

Eye-wash facility in battery charging area – battery acid being used

Respirators required – but no training provided

Tennis shoes worn while loading concrete blocks

Acid dip tank operation – no quick drench or flushing capability for body or eyes

No eye protection worn in metal plating area, exposure to splashing chemicals

Stairway has six risers and no handrail

Open sided floor – six foot drop – no guardrails

Fixed ladder – 30 feet high with no cage guard

Portable dockboard without any securing device to prevent slipping

Welding electrode cable lead damaged and rayed, exposing bare wire

Hand-held electric circular saw equipped with a lock-on control switch

Hand-held portable electric grinder with no guard

No guarding provided to protect employees from flying chips of a metal turning lathe

Lesson 1 Test – Occupational Health Safety

1. The Occupational Safety and Health Administration (OSHA) was created within the Department of Labor. It has seven areas that it covers in its mission statement. Which of the following is **NOT** included?
 - a) Encourage employers and employees to reduce workplace hazards and to implement new or improved existing safety and health programs.
 - b) Maintain a reporting and record keeping system to monitor job performance.**
 - c) Establish training programs to increase the number and competence of occupational safety and health personnel.
 - d) Develop mandatory job safety and health standards.
2. The Employee Right-to-Know Act was passed by the Minnesota Legislature in 1983. It is intended to make sure that employees are aware of dangers. Which danger is **NOT** part of this act?
 - a) Hazardous substances.
 - b) Harmful physical agents.
 - c) Infectious agents.
 - d) Personal Protective Equipment.**
3. Harmful physical agents include heat, noise, ionizing radiation and non-ionizing radiation. Which statement is **NOT TRUE**?
 - a) Heat-related health problems result from a combination of body heat and heat exposure.
 - b) All employers must protect workers from noise levels that exceed air line standards.**
 - c) Ionizing radiation occurs in hospitals and dental offices with X-ray machines.
 - d) Possible sources of non-ionizing radiation include lasers and microwave heaters.
4. Which of the following is **NOT** a harmful infectious agent?
 - a) Blood pathogens.
 - b) Bacteria.
 - c) Saliva.**
 - d) Parasite.

5. **Air Contaminants are measured in PELs. What does this abbreviation stand for?**
- a) Personal Experience levels.
 - b) Permissible Exposure Limits.**
 - c) Particle Experimental Limits.
 - d) Potential Employer Liabilities.
6. **Employers who collect, process or dispose of waste regulated under the Federal Resource Conservation and Recovery Act are exempt from hazardous substances and harmful physical agents training. Which of the following is NOT EXEMPT?**
- a) Bloodborne pathogens.**
 - b) Solvents.
 - c) Flammables.
 - d) Corrosives.
7. **Employers are required by law to maintain accurate records in injuries and illnesses. Which item below does NOT require record keeping?**
- a) Work-related deaths.
 - b) First aid treatment.**
 - c) Loss of consciousness
 - d) Work-related fatality or illness.
8. **Which of the following is NOT considered an OSHA-defined medical treatment?**
- a) Foreign bodies embedded in eye.
 - b) Back injury.
 - c) Prescription medications for allergies.**
 - d) Admission to hospital.

9. When evaluating pre-existing medical conditions associated with previous injuries and illnesses, which one should **NOT** be recorded as a recurring symptom?

a) **Silicosis.**

b) Dermatitis.

c) Respiratory.

d) Fractures.

10. Many workplaces contain spaces that are considered to be “confined”. Which of the following is a **FALSE** statement?

a) An area is confined if it hinders the activities of any employee that must enter into, work in, and exit from them.

b) **An employee must wear Personal Protective Equipment when entering a confined space.**

c) Employees who work in confined spaces face increased risk of exposure to serious physical injury.

d) A confined space has limited means of entry or exit, large enough for an employee to enter, but not designed for occupancy.

2. Industrial Hygiene

Introduction

An industrial hygienist is trained in engineering, physics, chemistry or biology. They have knowledge and experience about the effects of health, and about chemical and physical agents under various levels of exposure. The industrial hygienist is involved with the monitoring and analytical methods required to detect the extent of exposure, and the engineering and other methods used for hazard control.

During this lesson the student learns what an industrial hygienist does. They also learn the meanings of terms, general health and rules associated with specific health hazards. This includes history highlights of industrial hygiene, its definition, the recognition of health hazards and the control of environmental factors.

Outcomes

Outcomes

After completion of Lesson 2, students can describe what an industrial hygienist does, what industrial hygiene means, the recognition of certain health hazards and the four environmental factors or stresses that can cause sickness, impaired health or significant discomfort.

Pre-Quiz

1. In the sixteenth century, industrial hygiene was considered to be?

- A) A demon.**
- B) A dirty worker.
- C) A gold miners' disease.
- D) A Roman medical treatment.

2. An industrial hygienist?

- A) Studies electrical engineering.
- B) Evaluates chemical and physical agents.**
- C) Monitors radiation exposure records.
- D) Performs medical treatments.

3. What Environmental Factor does NOT belong in this list?

- A) Chemical hazards.
- B) Physical hazards.
- C) Emotional hazards.**
- D) Biological hazards.

Lesson Summary

Lesson 2 deals with:

- Recognizing Health Hazards
- Control Of Environmental Factors

To better understand the types of hazards that an industrial hygienist recognizes and evaluates, the following extensive set of hazards, with detailed descriptions, is provided for the students' review: Combustion, high temperatures, induction heating, melting, electric discharge, grinding, sifting, mixing, bending, small parts, coating operations, painting, explosive, warehousing, electroplating, printing operations, battery plant, open surface tanks, molten metal, sand blasting, fork lift, fiberglass, jackhammers, roofers and chemical storage.

The various environmental factors or stresses that can cause sickness, impaired health, or significant discomfort in workers are classified as chemical, physical, ergonomic, or biological.

Reference Highlights

Industrial Hygiene has been defined as "that science or art devoted to the anticipation, recognition, evaluation, and control of those environmental factors or stresses, arising in or from the workplace, which may cause sickness, impaired health and well-being, or significant discomfort and inefficiency among workers or among the citizens of the community."

Additional Reference Sources

American Conference of Governmental Industrial Hygienists (ACGIH)

Kemper Woods Center
1330 Kemper Meadow Drive
Cincinnati, Ohio 45240
(513) 742-2020

Professional society of persons employed by official governmental units responsible for full-time programs of industrial hygiene. Devoted to the development of administrative and technical aspects of worker health protection.

American Industrial Hygiene Association (AIHA)

2700 Prosperity Ave
Suite 250
Fairfax, Virginia 22031
(703) 849-8888

Professional society of industrial hygienists. Promotes the study and control of environmental factors affecting the health and well-being of industrial workers.

Lesson 2 Test – Industrial Hygiene

1. The “father of industrial medicine” was:

- a) Pliny the Elder, a Roman scholar.
- b) Agricola, a German scholar.
- c) Bernardino Ramazzini, from Italy.**
- d) Galen, a Greek physician in Rome.

2. Industrial Hygiene is defined as:

- a) That science or art devoted to the anticipation, recognition, evaluation and control of environmental factors in the workplace that cause sickness or impaired health.**
- b) That science or art devoted to the anticipation, recognition, evaluation and control of hazardous materials in the workplace that cause injury or death to workers.
- c) That science or art devoted to medical treatment associated with sickness, impaired health or significant discomfort of workers exposed to airborne contaminants.
- d) That science or art devoted to the study of engineering, physics, chemistry and biology

3. Which of the following health hazard statements is FALSE?

- a) Any process involving combustion should be looked at to determine what effects the byproducts of combustion may release to the environmental ozone layer.**
- b) Any process involving high temperature should be questioned for the possibility of excessive heat exposure to the employee.
- c) Any process involving induction heating, including microwave, should be questioned as to the heating effects on the employees.
- d) Any process involving an electric discharge in air should be examined for the possibility of production of ozone and oxides of nitrogen.

4. An electric discharge is?

- a) An arc or spark.
- b) Static electricity.
- c) Lightning.
- d) All of the above.**

5. When grinding, which of the following statements is **FALSE** ?
- a) Grinding, crushing or comminuting of any material involves the hazard of dust.
 - b) Wet grinding will have possible hazards of mist, dust and noise.
 - c) Dry grinding, including milling and sandblasting, creates dust and noise hazards
 - d) Dust collected on parts, as the result of grinding, can cause an explosion hazard.**
6. Which of the following does **NOT** present a dust hazard?
- a) Sifting, conveying, sieving and screening.
 - b) Mixing of dry materials.
 - c) Cold bending, forming or cutting of metals without lubricant.**
 - d) Explosive processing involving gases such as carbon monoxide and nitrogen.
7. Which of the following health hazards requires a worker to take a shower and change clothes after work to protect their skin and eyes?
- a) Coating operations that use solvent degreasing.
 - b) Painting operations that use toxic and irritating solvents.
 - c) Electroplating, when depositing metal on the surface finish.**
 - d) Sandblasting, when the dust is too thick to breathe.
8. Which operation can cause Raynaud's Phenomenon or "dead fingers"?
- a) Printing operators.
 - b) Fork lift operators.
 - c) Molten metal operators.
 - d) Jackhammer operators.**

9. Which operation does NOT cause a skin AND breathing health hazard?

- a) Working in a battery room.
- b) Working with small plumbing parts.**
- c) Filling an open surface tank.
- d) Working with chemical storage.

10. Various environmental factors can cause sickness, impaired health or significant discomfort. Which statement below is **FALSE**?

- a) Chemical hazards are from airborne mists, vapors, gases or solids in the form of dusts or fumes that can effect breathing and skin irritation.
- b) Physical hazards include excessive levels of electromagnetic and ionizing radiation, noise, vibration, temperature and pressure.
- c) Ergonomic hazards include improper fire escapes, lighting conditions and electric hazards in the occupational environment.**
- d) Biological hazards include insects, molds, fungi and bacterial contaminants such as industrial waste, sewage, food handling and personal cleanliness.

3. Environmental Factors

Introduction

It is important that our youth understand the various environmental factors or stresses that can cause sickness, impaired health, or significant discomfort to them at work. In **Lesson 3** they learn about environmental factors such as chemical hazards, physical hazards, ergonomic hazards and biological hazards. We don't want them to be exposed to a hazard, when it can be prevented.

Outcomes

After completion of Lesson 3, they can describe what environmental factors are, how to look for them, and how these environmental factors can cause sickness, impaired health or significant discomfort.

Pre-Quiz

1. Environmental Factors include:
 - A) Loud noises.
 - B) Toxic gas.
 - C) Tool design.
 - D) All of the above.**

2. Safety hazards labeling is required by the:
 - A) Occupational Health and Safety Administration Act.**
 - B) Federal Alcohol Administration Act.
 - C) Consumer Product Safety Act.
 - D) Federal Hazardous Substances Act.

3. Asbestos is:
 - A) A chemical hazard.
 - B) A physical hazard.**
 - C) An ergonomic hazard.
 - D) A biological hazard.

Lesson Summary

During **Lesson 3** the student learns what environmental factors are. They learn the meaning of terms, general health rules and the requirements to protect them from chemical, physical, ergonomic and biological hazards.

They are introduced to the Material Safety Data Sheets (MSDS), containing information about hazardous materials, drugs and chemicals.

Chemical exposure may cause or contribute to many serious health effects such as heart ailments, kidney and lung damage, sterility, cancer, burns and rashes.

The majority of the occupational health hazards are from inhaling chemical agents in the form of vapors, gases, dusts, fumes, and mists, or by skin contact with these materials. The students are presented with details about the routes of entry of chemicals, including inhalation, absorption, ingestion and injection.

Air contaminants are commonly classified as either particulate contaminants or gas and vapor contaminants. The most common particulate contaminants include dusts, fumes, mists, and fibers.

The students learn about multiple **physical** hazards. Toxic hazards such as asbestos, airborne concentration, respiratory protective equipment, permissible exposure limits, hygiene facilities and practices are covered. Welding health hazards include a multitude of chemical and physical agents. Noise is another physical health hazard that is covered in length.

The students learn about **Ergonomics** as the study of the design of requirements of work in relation to the physical and psychological capabilities and limitations of people. Ergonomic hazards exist whenever there is a combination of stressors or workplace conditions that may cause harm to an employee.

Ergonomic hazards include improperly designed tools or work areas, improper lifting or reaching, poor visual conditions, or repeated motions in an awkward position. A workstation job hazard is determined by job requirements, including force, posture and repetition.

Biological hazards include insects, molds, fungi, and bacterial contaminants such as sanitation and housekeeping items including potable water, removal of industrial waste, sewage, food handling and personal cleanliness. Biological and chemical hazards overlap.

Reference Highlights

Distilled spirits (beverage alcohol), wine or malt beverage labels follow the Federal Alcohol Administration Act.

Consumer products are defined in the Consumer Product Safety Act.

Any hazardous substance is defined in the Federal Hazardous Substances Act.

About 32 million workers are potentially exposed to one or more chemical hazards. There are an estimated 575,000 existing chemical products, and hundreds of new ones being introduced annually.

There are 2.9 million workers in American production industries who experience 8-hour noise exposures in excess of 90 dBA. An additional 2.3 million experience exposure levels in excess of 85 dBA. The Hearing Conservation Amendment (HCA) applies to all 5.2 million employees except for those in oil and gas well drilling and service industries.

Typical sound levels include:

- 140 dB – Threshold of pain
- 125 dB – Jet takeoff
- 95 dB – Jackhammer
- 85 dB – Heavy truck
- 75 dB – Vacuum cleaner
- 35 dB – Soft whisper
- 0 dB – Threshold of hearing

A professional audiologist, otolaryngologist or physician must be responsible for a hearing program. An employee that has lost hearing ability is based on the average shift (or loss) in either ear of 10 dB or more at the 2,000-, 3,000- and 4,000-Hertz (Hz) frequencies. Audiometric tests are pure tones, air conduction and hearing threshold examinations, with test frequencies including as a minimum 500, 100, 2000, 3000, 4000 and 6000 Hz. Tests at each frequency are taken separately for each ear.

Acoustic Trauma. A hearing injury produced by exposure to sudden intense acoustic energy, such as from blasts and explosions or from direct trauma to the head or ear. It should be thought of as one single incident relating to the onset of hearing loss.

Air Conduction. The process by which sound is conducted to the inner ear through the air in the outer ear canal utilizing the tympanic membrane (eardrum) and the ossicles as part of the pathway.

Audible Range. The frequency range over which normal ears hear (approximately 20 Hz through 20,000 Hz).

Bone Conduction. The process by which sound is conducted to the inner ear through the cranial bones.

Dosimeter. A device worn on the person for determining the accumulated sound exposure with regard to level and time.

Eustachian Tube. A tube approximately 2 ½ inches long leading from the back of the throat to the middle ear. It equalizes the pressure of air in the middle ear with that outside the eardrum.

Hearing Loss. An increase in the threshold of audibility, at specific frequencies, as the result of normal aging, disease, or injury to the hearing organs.

Meniere's Disease. The combination of deafness, tinnitus, nausea, and vertigo.

Noise Induced Hearing Loss. Means the slowly progressive inner ear hearing loss which results from exposure to noise over a long period of time as contrasted to acoustic trauma or physical injury to the ear.

Since 1990, both Federal OSHA and MNOSHA have had a special emphasis program in the meatpacking industry to identify and cite conditions leading to cumulative trauma disorders (CTDs). The Meat Packing Task Force was formed by MNOSHA to prepare inspection teams of both safety and health to handle the growing number of ergonomic complaints received in general industry outside the meat and poultry plants, the scope of the team's inspections was broadened and its name was changed.

Additional Reference Sources

Centers for Disease Control and Prevention (CDC)

U.S. Department of Health and Human Services
1600 Clifton Ave, N.E.
Atlanta, Georgia 30333
(404) 329-3311

Surveys national disease trends and epidemics and environmental health problems. Promotes national health education program. Administers block grants to states for preventive medicine and health services programs.

Environmental Protection Agency (EPA)

401 M. Street S.W.
Washington, D.C. 20460
(202) 382-4361

Administers federal environmental policies, research and regulations. Provides information on many environmental subjects including water pollution, hazardous and solid waste disposal, air and noise pollution, pesticides, and radiation.

Lesson 3 Test – Environmental Factors

1. Safety hazards labeling is required by the:
 - a) Consumer Product Safety Act.
 - b) Federal Hazardous Substances Act.
 - c) Occupational Health and Safety Administration Act.**
 - d) Federal Alcohol Administration Act.
2. In order for a harmful chemical agent to have its toxic effect, it must come into contact with the body. Which of the following is **NOT** a route of entry?
 - a) Noise or vibration through the ears.**
 - b) Absorption through direct contact with the skin.
 - c) Inhalation or breathing.
 - d) Ingestion, eating or drinking.
3. Air contaminants are gases or vapors. What measurement is used to measure their diameter?
 - a) TWA.
 - b) PEL.
 - c) Micron.**
 - d) ppm.
4. Asbestos is a mineral and a fiber. What kind of health hazard is it?
 - a) Chemical.
 - b) Physical.**
 - c) Ergonomic.
 - d) Biological.

5. **Permissible Exposure Limits (PELS) are enforceable by law. Employers must keep employee exposure levels below the PELs of regulated substances. What level is required for an airborne concentration of asbestos?**
- a) 25 fibers per cubic volume of air in a forty-hour period.
 - b) 0.3 fibers per milligram of vapor in an eight-hour period.
 - c) 0.2 fibers per cubic centimeter of air in an eight-hour period.**
 - d) 0.01 fibers per square meter of surface in a forty -hour period.
6. **Welding can cause a health hazard called “metal fume fever” from the use of what chemical agent?**
- a) Zinc.**
 - b) Mercury.
 - c) Lead.
 - d) Ozone.
7. **Physical agents generated or produced during the welding process can cause severe burns or retina damage. Which agent is NOT a physical agent?**
- a) Ultraviolet radiation.
 - b) Intense visible light.
 - c) Infrared radiation.
 - d) Lasers.**
8. **There are more than 5 million workers in American industries that experience high levels of noise exposure in their jobs. The Hearing Conservation Amendment (HCA) requires noise exposure levels of 90dBA for 8 hours. What is the sound level of a jackhammer?**
- a) 140 dB.
 - b) 125 dB.
 - c) 95 dB.**
 - d) 75 dB.

9. Sound is the Ear/Brain response to rapid fluctuations in air pressure. Which of the items below is **NOT** used to measure sound?

a) The threshold of hearing is based on air pressure changes.

b) Particle concentrations are measured by milligrams per cubic meter of air.

c) Wavelength is acoustics, usually expressed in feet.

d) Sound intensity/sound pressure level is measured in Decibel (dB) scale.

10. Ergonomic hazards are measured in what units?

a) Cumulative Trauma Disorders (CTD).

b) Temporary Threshold Shift (TTS).

c) Permanent Threshold Shift (PTS).

d) Feet Per Second (FPS).

4. Basic First Aid

Introduction

Students learn how to handle emergency situations, recognize health issues and symptoms in the workplace, and care for basic treatments of victims.

KEEP CALM. Remaining calm while helping the victim will help he/she to keep calm and cooperate. If the victim becomes anxious or excited the extent of the damage from the injury could be increased.

PLAN QUICKLY WHAT YOU NEED TO DO. Learn basic procedures, or have your first aid manual available, so you can care for the victim.

SEND FOR PROFESSIONAL HELP. Reaching help quickly could save a life. Know your local emergency telephone numbers.

BE AN ENCOURAGEMENT TO THE INJURED PERSON. Let the victim know that help is on the way and try to make them as comfortable as possible. Showing care and concern for the victim can give them hope during their circumstances.

Outcomes

In **Lesson 4** students learn about basic first aid, what to look for and what to do. They learn how to recognize health issues and symptoms in their workplace, and can care for basic treatments of victims. After completing Lesson 4, they also have a reference source to provide for some of the most common first aid practices.

Pre-Quiz

1. What is the proper name given to a low level of oxygen?
 - A) Bradycardia.
 - B) Hypoxia.**
 - C) Tachycardia.
 - D) Hypothermia.

2. What is NOT included in a basic First Aid Kit?
A) Bandages.
B) Aspirin.
C) Splints.
D) Tape.

3. What is the symptom of a sprain?

A) Affected joint begins to swell immediately.
B) Victim begins to faint.
C) High fever.
D) Loss of weight.

Lesson Summary

Some employers are required to have trained personnel and first responders available at the job site. This lesson does not cover all aspects of medical conditions, treatments or diagnosis. Students should always rely on professional assistance whenever possible. Those first aid topics provided can help guide them through basic treatments of common first aid in the workplace.

Students learn the essential contents of a first aid kit, and those extras that may be necessary in an emergency. They also learn the basic principles in cleaning and bandaging wounds.

First Aid treatments, including symptoms, are covered for Bites and Stings, Burns, Cuts and Abrasions, Eye Injuries, Dislocations, Fainting and Unconsciousness, Fractures, Frostbite, Hypothermia, Nosebleeds, Poisoning, Sprains, Bleeding, and Choking. Spider bites, ticks and Lyme disease and snakebites are NOT covered in this section.

Reference Highlights

In a major emergency, time is a critical factor in minimizing injuries. Most small business do not have a formal medical program, but they are required to have the following medical and first-aid services:

1. In the absence of an infirmary, clinic or hospital close to the workplace that can be used for treatment of all injured employees, the employer must have someone that is adequately trained to render first aid.
2. Where the eyes or body may be exposed to corrosive materials, eye washes or suitable equipment for quick drenching and flushing must be provided in the work area for immediate emergency use. Employees must be trained to use the equipment.
3. The employer must ensure that medical personnel are available for advice and consultation on matters of employee health. This does not mean that health care must be provided, but that, if health problems develop in the workplace, medical help is available to resolve them.

Lesson 4 Test – Basic First Aid

1. Which of the following trained medical personnel are NEVER required to be at the job site?
 - a) First responder.
 - b) Nurse.
 - c) Dentist.**
 - d) Emergency Medical Technician.
2. What is the term used to describe a condition where the body temperature rises above normal and the person feels sick and dizzy?
 - a) Exposure.
 - b) Myocardial Infarction.
 - c) Shock.
 - d) Heat exhaustion.**
3. Which items are typically NOT found in a first aid kit?
 - a) First Aid Manual.
 - b) Basic Bandages.
 - c) Basic Needles and Syringes.**
 - d) Basic Drugs/Lotions.
4. What should you NOT do when cleansing and bandaging wounds?
 - a) Wash your hands.
 - b) Cut away dead skin.**
 - c) Apply antibacterial ointment.
 - d) Cover with a sterile gauze dressing.

5. What type of burn is visibly charred and may be white?

- a) Sunburn.
- b) First degree burn.
- c) Second degree burn.

d) Third degree burn.

6. Symptoms of lightheadedness, weakness, nausea and skin that may be pale or clammy usually indicates what possible condition?

- a) Drunk.
- b) Fainting.**
- c) Food poisoning.
- d) Hypothermia.

7. The most common dislocations **DO NOT** occur in?

- a) Shoulders.
- b) Elbows.
- c) Fingers.

d) Knees.

8. Vigorous, uncontrollable symptoms of shivering indicate?

- a) A wind chill of minus 20 degrees Fahrenheit.
- b) Shock.

c) Hypothermia.

- d) Seizure.

9. Basic first aid includes the term “ABCs”. What do these letters NOT stand for?

- a) Breathing.
- b) Circulation.
- c) Sterilization.**
- d) Airway.

10. The Heimlich Maneuver is used for what symptom?

- a) Heart attack.
- b) Choking**
- c) Fainting.
- d) Frostbite

5. CPR

Introduction

This section is intended as a supplement to information learned in a complete CPR course instructed by OSHA and the American Heart Association. It is **NOT** to be used as your only guide for CPR unless in emergency situations. Please use this only as a guideline for the proper steps in CPR. For more information, please contact OSHA or your local American Heart Association for class information.

CPR (Cardio Pulmonary Resuscitation) has been shown to prolong life until trained medical personnel arrive to administer professional care. CPR has been used primarily to revive victims of cardiac arrest, but it has also saved victims of drowning, respiratory failure, and drug overdose.

Outcomes

In Lesson 5 students learn the principles and procedures used in administering CPR. Please use this only as a guideline for the proper steps in CPR. For more information, please contact OSHA or your local American Heart Association for class information.

Pre-Quiz

1. CPR stands for?
 - A) Corrective Procedures For Recordkeeping.
 - B) Cardio Pulmonary Resuscitation.**
 - C) Critically Proven Regulations.
 - D) None of the above.

2. The ABCs of CPR is?
 - A) Airway.
 - B) Breathing.
 - C) Circulation.
 - D) All of the above.**

3. Do not use your thumb to take the pulse of someone else because:

- A) You will be feeling your own pulse.
- B) Two of your fingers against a victims' neck will indicate the pulse of the victim.
- C) If the victim has no pulse, they need CPR immediately.
- D) All of the above.**

Lesson Summary

Students learn the ABCs for assessing a patient:

Airway: Is the airway open or blocked? Is there something preventing the patient from being able to breathe? If there is, you need to CLEAR THE AIRWAY quickly! If it IS clear, make sure it stays that way!

Breathing: Is the patient breathing? If NO, you must act quickly and perform Rescue Breathing! If YES, note the rate and depth. If breathing is really slow and/or shallow, you'll need to help them breathe properly.

Circulation: If the patient is unconscious, press two fingers gently against the side of their neck just below the jaw and feel for a pulse. If their conscious, check there or at their wrist. DO NOT use your thumb to check a pulse, you'll feel your OWN pulse! If there's NO PULSE, the patient needs CPR Now! If the pulse is weak and/or rapid, the patient may be going into shock!

Students also learn how to deal with **airway obstructions**. There are two ways of clearing an obstructed airway. The method used depends on whether the patient is CONSCIOUS or UNCONSCIOUS.

A complete discussion about **rescue breathing** (mouth-to-mouth) is provided as a simple, quick technique that can make the difference between life and death for a non-breathing person. Other topics discussed include:

Shock, including blood loss, failure of the heart to pump properly, extreme allergic reaction, and neck/spine injury.; **seizures**, the most common being epilepsy, heat injury, brain/head injury, and overdoses; and, **chest pain**. Although there are numerous reasons for chest pain, you CANNOT rule out a heart attack with seeing a doctor! The best thing you can do for someone suffering from chest pain is to encourage them to seek prompt medical attention! Denial is very common among heart attack victims, so be positive and encouraging, but stern in your insistence that they seek help! The key here is that "TIME IS MUSCLE" ... the longer the victim waits, the more permanent damage the heart muscle suffers.

CPR is a combination of mouth-to-mouth resuscitation and chest compression. "Mouth-to-mouth helps get air into the victim's lungs while chest compression forces oxygen-rich blood to the brain and other organs. Unless CPR is administered within 4 minutes of an arrest, the brain can be irreversibly damaged from lack of oxygen. Both adult and child CPR steps are summarized using a single operator and two operator technique.

Reference Highlights

More than five million people each year receive CPR training from instructors taught by the American Heart Association or the American Red Cross. The timely application of CPR has helped thousands of lives each year in the United States. Better understanding of CPR and refinements in its use can help save more lives.

The American Heart Association and the American Red Cross, the organizations responsible for most CPR training in the United States, adopted new CPR science guidelines on October 28, 1992. The new guidelines recommend ...

- Addition of the recovery position (rolling the victim on his or her side) to all procedures for victims who are breathing effectively on their own, or who resume effective breathing at any time during the delivery of resuscitation efforts.
- Repositioning the victim's head after each unsuccessful attempt to ventilate, before re-attempting ventilation.

Most of these changes have been developed to improve the victim's chances of recovery, and also to simplify teaching CPR skills.

Lesson 5 Test – CPR

1. **Cardio Pulmonary Resuscitation (CPR) is used to revive victims of?**
 - a) Cardiac arrest.
 - b) Drowning.
 - c) Drug Overdose.
 - d) All of the above.**
2. **For ALL emergencies, you should quickly assess the patient to find out if ...?**
 - a) The airway is open or blocked.
 - b) The patient is breathing.
 - c) The patient is unconscious.
 - d) All of the above.**
3. **For obstruction of the airway, which statement is CORRECT for an unconscious victim?**
 - a) The head should be immediately tilted back in order to see if the victim has a traumatic injury such as a head injury in an auto accident.
 - b) If the victim doesn't have a head injury, place two fingers under each side of their jaw and gently push the jaw straight up and out, with the patient laying on their back.**
 - c) Immediately perform the Rescue Breathing technique to see if you can get any air into their lungs with two rapid breaths.
 - d) Open the mouth and move your fingers around to see if you can grab any object that has been stuck in their throat.
4. **What does "mouth-to-mouth" mean?**
 - a) The technique used to attach a protective device to your mouth and that of the victim
 - b) The technique used to check the airway, breathing and circulation.
 - c) A simple, quick technique that assists a victim to regain their own breathing.**
 - d) A firm vacuum between the lips of the victim and the first responder to create suction.

5. What is the definition of “shock”?

- a) Blood loss.
- b) Failure of the heart to pump properly.
- c) An extreme allergic reaction.

d) Inadequate tissue perfusion.

6. If someone is having a seizure, what statement below indicates the proper thing to do?

- a) Restrain or stop the victim by performing the Heimlich Maneuver.
- b) Protect the victim during the seizure by removing any obstacles or objects they could be injured from.**
- c) Place a ruler, book or other object into their mouth so they don't swallow their tongue.
- d) Lay the victim on their back and immediately begin rescue breathing so they do not become unconscious.

7. What is NOT a symptom of chest pain related to a heart attack?

- a) Tightness/pressure in the center of the chest.
- b) Sweaty, clammy skin.
- c) Indigestion, bloating of the stomach and feeling faint.**
- d) Numbness in one or both shoulders or pain radiating down either or both arms

8. CPR is a combination of mouth-to-mouth resuscitation and chest compression. Which statement below in NOT correct?

- a) Mouth-to-mouth helps get air into the victim's lungs.
- b) Chest compression forces oxygen-rich blood to the brain.
- c) The brain can be irreversibly damaged from lack of oxygen.
- d) Rescue breathing forces adequate blood supplies to the brain.**

9. What group below is **NOT** considered to be “high-risk” for cardiac arrest or respiratory failure?

a) Those with personal or family history of heart attacks.

b) Those that are not physically able to administer CPR.

c) Those with angina or high blood pressure.

d) Those that are overweight.

10. Which is the **MOST IMPORTANT** step in administering CPR?

a) Open the Airway.

b) Look, listen and feel for Breathing.

c) Check for pulse and Circulation.

d) All of the above.

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